Finally, and this applies to all the regions involved, there is to be taken into account the many species, weeds and cultivated plants, which have been introduced through the agency of man. A study of these immigrants—the origin of most of which can be fairly well ascertained, especially when they have been long established in their new habitat—ought to be one of the best means of determining the effects, if any, of a changed environment. The vexed question of the inheritance of such acquired changes can thus be studied on a large scale and under normal conditions. It is surprising that so little attention has been paid to this great field by the many students of mutation and genetics who set the fashions in biology just now.

These are but a few of the many problems which might be undertaken by the botanist in this vast region which it is proposed to explore. It is perhaps presumptuous for one whose work has been mainly in other directions, to suggest what are the most important lines of work in fields in which he is very much of an amateur.

NERVOUS TRANSMISSION IN SEA-ANEMONES

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The retraction of a sea-anemone like Metridium can be accomplished by stimulating mechanically almost any point on its exterior. Hence there must be nervous connections between all points on the surface open to stimulation and the longitudinal muscles of the mesenteries by which retraction is brought about. To ascertain how extensive these connections are, the following experiments were tried. The column wall of a Metridium was completely girdled by a cut deep enough to penetrate the wall but not sever the mesenteries. Stimulation of either the oral or pedal portion of the partly divided animal resulted in general retraction. Complete removal of the oral half left the pedal half capable of retraction. Tongues of column wall cut in any direction and as long as five centimeters transmit when stimulated at their free ends to the longitudinal muscles thus causing retraction. If a Metridium is cut through vertically except for the pedal disc or a piece of the column or the oral disc, the stimulation of one piece will cause the whole animal to retract. If an oblong outline is cut on the column wall so that the encircled area remains attached to the rest of the animal only by the mesenteries, stimulation of this area is followed

by the retraction of the animal as a whole. It thus appears that the connections between the surface of the sea-anemone and the deep seated muscles concerned with retraction are so numerous and devious that a nervous network is the only basis of explanation. That this nervous network is not equally developed in all parts of the animal's body is seen from the fact that when a sea-anemone is cut vertically in two except for the lips, it is very difficult to get a retraction in one half of the body when the stimulus is applied to the other half. The lips are poor means of transmission compared with other parts of the body. Notwithstanding the generally diffuse condition of the transmission system in Metridium, there is evidence also for a certain degree of specialization in the parts concerned. Stimulation of the tentacles by mussel juice calls forth a gaping of the oesophagus (contraction of the transverse mesenteric muscles) and by weak hydrochloric acid a retraction of the oral disc (contraction of the longitudinal mesenteric muscles). These two forms of response afford good ground not only for the assumption of independent receptors but of relatively independent transmission tracts, a first step in the kind of differentiation so characteristic of the nervous organization in the higher animals.

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THE RESPONSES OF THE TENTACLES OF SEA-ANEMONES

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As long ago as 1879 von Heider announced that tentacles severed from a sea-anemone were capable of much the same range of activities that these organs exhibit when normally attached to the animal. This statement has been variously accepted or questioned by subsequent workers. Favorable material for testing its validity was found in the Bermudian sea-anemone Condylactis. The tentacles of this form may measure as much as 15 cm. in length and may have a basal diameter of 1.5 cm. Severed tentacles from Condylactis contract and remain so for some time. They can be brought to a state of least disturbance by suspending them on a metal hook in seawater. Under such circumstances they can be inflated by gently running seawater into them till they attain about two-thirds their ordinary length. In this condition they are under a pressure of not over a few millimeters of water. If this